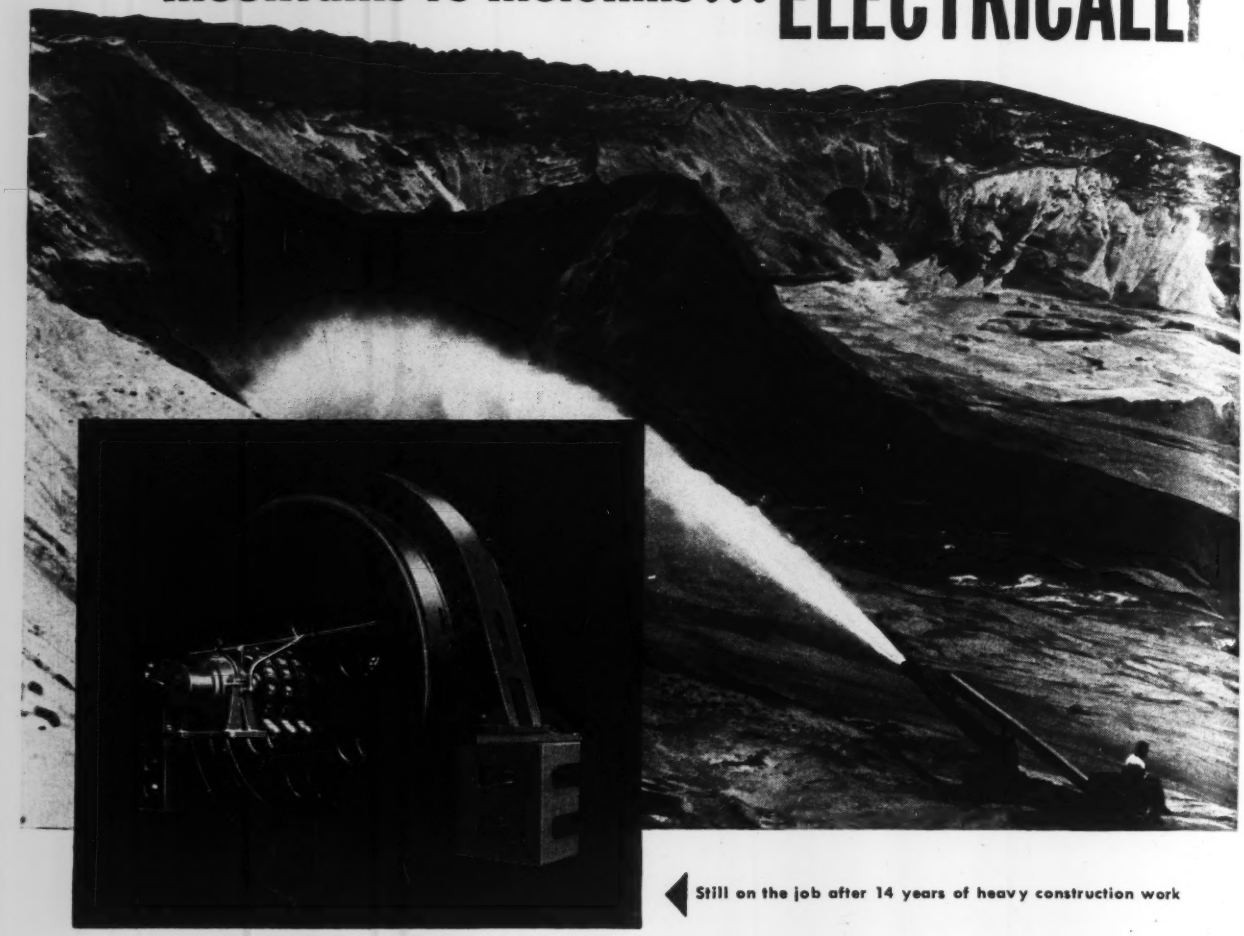
ENGINEERING NEWS-RECORD

NOVEMBER 4, 1948

Construction of the Missouri River Bridge on U.S. Highway 71 Near Atchison, Kansas, Is Described on Page 36

A McGRAW-HILL PUBLICATION

mountains to molehills . . . ELECTRICALLY



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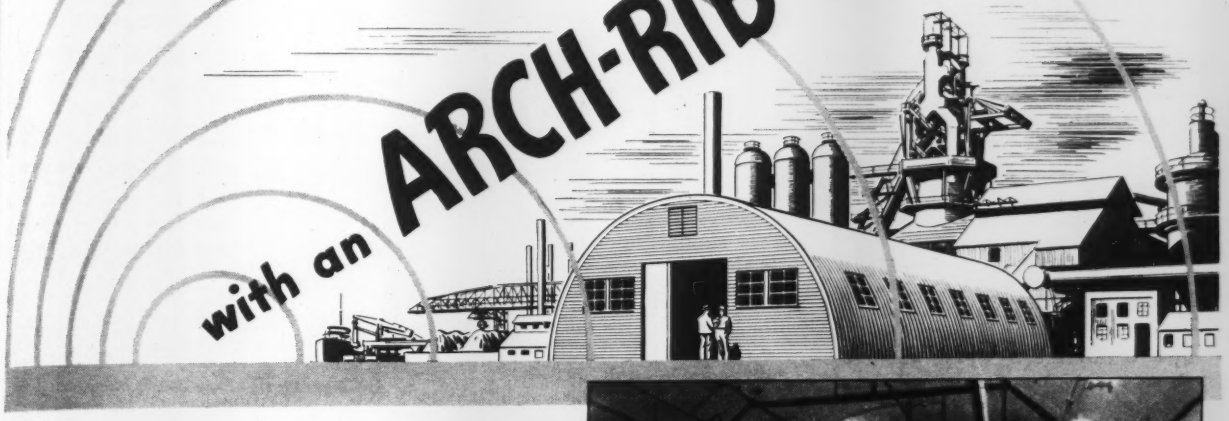

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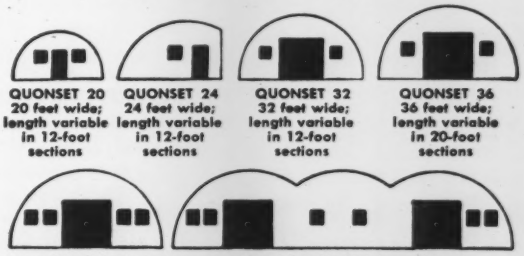

QUONSET 20 20 feet wide; length variable in 12-foot sections

QUONSET 24 24 feet wide; length variable in 12-foot sections

QUONSET 32 32 feet wide; length variable in 12-foot sections

QUONSET 36 36 feet wide; length variable in 20-foot sections

QUONSET 40—40 feet wide; length variable in 20-foot sections

QUONSET MULTIPLE—width variable in sections of 20'-6"; length variable in sections of 20'-0".

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NEWS BRIEFS

Water Supply and Sewers—Bids for the construction of the new $26,000,000 additions to the water works at *Havana, Cuba*, will be received by the Municipal Administration on Dec. 10. . . . At *Jamestown, N. D.*, voters have approved a $1,000,000 bond issue for extension of water and sewer facilities . . . Two years of work, stalemated by failure to reach an agreement to empty sewer lines into Harrisburg and Paxtang mains, has led to a decision to suspend meetings of the *Susquehanna Township, Pa.* Authority. . . . *Decatur, Ind.*, is working on plans for a sewage treatment plant.

Dams—Enders Dam, *Nebraska*, now 75 percent complete, should be finished by next July 1, according to U. V. Engstrom, construction engineer, Bureau of Reclamation . . . Brazos River Conservation and Reclamation district directors at *Fort Worth, Tex.*, voted to plan financing and building four big dams in central west Texas to cost about $25,000,000 . . . Representatives of *Big Spring, Midland, Colorado City*, and *Odessa, Tex.*, will study plans and make recommendations regarding the building of two dams to cost $12,500,000—one across the Colorado River and one across Bull Creek in Scurry County—to supply the four cities with 30,000,000 gpd. . . . Whitney Dam on the Brazos River, near *Waco, Tex.*, will be completed by 1951. The $40,000,000 Corps of Engineers structure will have a concrete gravity type center flanked by rolled earth embankments . . . Utah Construction Co., San Francisco, is low bidder at $10,301,657 on Bonny Dam on the Republican River, *Kansas* . . . A 10,350-acre lake will be created in *Reynolds* and *Wayne counties, Mo.*, by the Clearwater Dam near Piedmont. The dam is 4,225 ft. long and 154 ft. above the stream bed of the Black River.

Public Construction—On Nov. 17 there will be a hearing before the U. S. Army board of engineers on the proposed *Lake Erie-Ohio River* canal project . . . Preliminary survey will be made soon on a proposed $800,000 granite block breakwater at *Southwest Harbor, Me.* . . . H. P. Cummings Const. Co., Ware, Mass., has a $1,116,000 contract for a hospital at *St. Albans, Vt.* . . . Cornerstone was laid Oct. 12 for the new Pan American Union building at *Washington, D. C.* The $2,400,000 structure is to be completed by next May . . . Bids are to be opened by U. S. Engineers Nov. 9 for the first phase of the $13,000,000 harbor deepening and improvement project at *Buffalo, N. Y.* . . . *Eugene, Ore.*, votes Oct. 26 on a bond issue to raise $3,750,000 for a 3-year school expansion program . . . Sound Const. & Engineering Co., *Seattle, Wash.*, has notice to proceed to build a VA hospital there on a low bid of $6,077,320 . . . A $5,021,327 construction program for five years is now under way at the University of Wyoming, *Laramie* . . . The Department of Architecture and Engineering of *Illinois* has announced plans to erect 20 state armories to cost $25,000,000.

Housing—*Connecticut* State Housing Authority has allotted $29,000,000 to 34 municipalities for moderate rental housing projects . . . Plans for a cooperative veterans' housing project under which 86 units would be built in *St. Paul, Minn.*, at a cost of $7,100 apiece are being considered by the St. Paul Housing and Redevelopment Authority . . . Joseph M. Boehm has plans for a 100-family, $1,450,000 apartment and garage building on the waterfront at *Buffalo, N. Y.* . . . "Normador", a development of 120 frame and cedar shakes homes is under way at Bellaire, *Houston, Tex.*, and in the same city a $1,500,000 development of 250 homes for Negroes is also being carried out . . . It is estimated that housing production in the non-farm areas of *California* this year will amount to about 210,000 dwelling units . . . Large scale construction of $6,000 homes is being planned by builders in *Indianapolis, Ind.* . . . In *New York City* bids have been taken for South Beach Houses in Staten Island, and an 1188-apartment public housing project in Brooklyn.

THE COVER PICTURE

Mt. Morris Dam is a $21,000,000 Corps of Engineers concrete flood control structure under construction on New York State's Genesee River.

Extending out to midstream, the sheet piling cell-type cofferdam is completed and dredging operations are in progress. The right bank has already been cut into in preparation for foundation work.

The bridge is a temporary structure built by the contractor. Completion of the dam is planned for 1952.

A Wide World Photo.

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THE CONSTRUCTION WEEK

GRINDING FINE—Expected sales of 200,000 garbage-grinders this year—double 1947—suggests that housewives may settle an issue that now divides sanitary engineers. Since General Electric pioneered the device 20 years ago, engineers have been collecting data to show either (1) home-ground garbage is a menace and a curse to municipal disposal systems; or (2) the grinders will end not only individual but municipal disposal problems. Manufacturers are plugging their devices with obviously good sales results, but are unhappy over the continued "show me" attitude of many sanitary engineers. The New Jersey State Department of Health recently called the grinders "a creeping menace" to stream pollution clearance.

IRANIAN MONEY—To finance its hopeful $650,000,000 improvement plans (*ENR* Oct. 28, p. 73) Iran counts on present oil royalties of $1.50 per metric ton now aggregating about $33,000,000 yearly and expected to reach $60,000,000 within seven years; about $225,000,000 in current foreign exchange; and the rest from some world banking source. Nearly half of the money to be spent on the work would go outside Iran for materials and equipment. But observers are keeping their fingers crossed over the program, mindful that the Iranian parliament has been negative in its reception to previous proposals—hasn't even voted a full year's budget since 1943.

BASING-POINT BIBLE—Now available, free, is the Federal Trade Commission's 5,000-word "Statement of Policy Toward Geographic Pricing Practices for Staff Information and Guidance". Laying down the law for FTC staff members, the "bible" spells out the commission's position on cases it has pushed under the Federal Trade Commission Act (making unfair competition illegal) and the Clayton Act (making price discrimination illegal). Difficult to summarize, the report makes two things clear: (1) f.o.b. pricing is safe; (2) delivered-pricing methods are suspect.

HELP ON EQUIPMENT PURCHASES—If you are a contractor who has had to purchase equipment on credit until the first payments on the job come in, your plight has finally been discovered. On the $48,000,000 Hungry Horse Dam job in Montana, the U. S. Bureau of Reclamation is going to advance the contractor $3,000,000 to finance his equipment purchases before he turns a shovelful of dirt. Moreover, the Bureau thinks the idea is sound as a general thing, although it has not gone so far as to announce that it will generally follow it.

POLITICS ON PANAMA—The word, allowed to get out in Washington, to the effect that we will make a ground survey in Colombia for a new isthmian canal, should not be taken too seriously. We already know from aerial surveys that the height of the divide on the Atrato-Truando route is about 950 ft., and a ground survey could do little more than provide a check on this.

If the purpose of promising a survey was to force a more cooperative attitude from Panama, there are signs that it may already have achieved some success. Unfortunately, it is at the expense of Colombia, whose hopes have been falsely raised. Begging the question of whether such political forays are worthy of a first-class power, this one was unnecessary since it is generally agreed the canal improvement issue is dead until the world situation quiets down a good deal.

ATOM POWER OUTLOOK BRIGHTER—Normally the most pessimistic group in Washington when it comes to the possibilities of atomic energy for electric power production, the Atomic Energy Commission's General Advisory Committee has come up with by far its most optimistic report. Ultimate output of atomic energy in the U. S. may be as great or greater than present output of coal power, "and will operate at lower costs—as far as fuel costs are concerned," the group now believes. It bases this view on two assumptions: first that the cost of uranium does not rise importantly and that the theoretical possibilities of "breeding" atomic fuel (making fissionable materials produce other fissionable materials by transmutation during the reaction process) are realized. AEC's piles at Brookhaven, N. Y., and Chicago, may provide further answers.

CONSTRUCTION DEPARTMENT — Working quietly on its survey of governmental efficiency, the Hoover commission may suggest lumping all federal construction and engineering agencies under a single department, with a Secretary of Federal Works. Model will be the Public Roads Administration, which commissioners call an "almost ideal" federal construction agency from the standpoint of organization and freedom from politics.

ENGINEERING NEWS-RECORD

NOVEMBER 4, 1948 VOL. 141 NO. 19

See construction industry as a $27 billion business

Housing at a million units, public utilities and commercial buildings at increased tempo and expanding public works will keep construction at high level through 1949

A special report by McGraw-Hill Economics Staff

Construction—figured on the value of materials and the on-the-site cost of putting together roads, dams, buildings, houses, and other projects—will add up to a total of $18.5 billion in 1948. This figure, from the U. S. Department of Commerce, represents the cost of construction put in place. The *Engineering News-Record* estimate of the total contracts awarded during 1948, parts of which will be "put in place" in 1949, is about $15.5 billion.

This building activity, no matter how you measure it, makes up about one-twelfth of all U. S. business activity. Add to it the $8 billion-plus in materials and manpower that go into maintaining and repairing the U. S.'s existing buildings and structures and you have a $24 to $27-billion industry.

Moreover, unless some unexpected economic calamity blights business, the indications are that 1949 will see the industry doing an even larger volume of work.

Dollar volume in 1948 is smashing all records for the industry. It is running more than 30 percent ahead of 1947. But, because of price and cost increases, the industry's physical volume will be only 10 to 20 percent ahead of 1947.

Here's the shape of 1949, as it looks now, for construction:

Housing, presently the biggest single section of the industry, is having its best year, both dollar-wise and in the number of units going up. The industry will add about one million houses to the country's total this year. In dollars, that's about $8 billion worth. Overall, it accounts for more than one-third of all construction.

Housing emergency eased

Housing, however, has caught up with its most pressing demands. Census Bureau figures show that from 1941 through 1947 there was a net gain of slightly more than 4 million in the number of new families formed. This year will add 675,000 new families. On top of that there has been a net movement of several hundred thousand families from farms to towns. Altogether that makes about 5,000,000 families faced with finding a place to live.

In the same years, however, U. S. builders will have built more than 4 million new permanent nonfarm homes, have thrown up some 350,000 temporary homes, and have converted at least half-a-million apartments and homes out of space in existing buildings.

In short the people who had to get in out of the rain now have some place to live. The sharpest edge has gone from housing demand. Our stock of homes is now about as good relatively as it was in 1941.

That doesn't mean that housing can't or won't go on at a high level, however. There was a housing shortage even in 1941. In depression years the number of homes built fell far below the need.

Then, too, our standards in housing are rising. People are no longer content with the tenement apartments or Victorian houses they put up with before the war. New families will be formed in the years to come, too, and they'll require about a half-million new homes a year. Finally, there are perhaps 2 million families who are still "doubled up" with others.

All this means that next year—and 1950—are likely to see home building go on at about today's pace. A million homes a year for another year or two is still probable.

Housing financing tighter

One key to the rate of home-building in 1949 will be mortgage money. Reportedly, many banks are near the limit of the funds they can loan home buyers. Lending agencies, too, are asking higher interest rates and higher down-payments on homes—generally from 30 to 50 percent—than they have since VJ-Day.

This tightening in the mortgage market may shift building emphasis from single-family homes to multi-family units. Government policies now favor rental construction. In this way, 1949 may see as many units produced as will 1948, although more of them will be for tenants.

Because the money terms will be a little tighter next year than this, the chances are that housing activity will dip in the spring. If the industry then

SEVEN HUNDRED HOMES, now under construction at Tucson, Ariz., are part of a 3,000-unit development planned by Del E. Webb Construction Co. The 250-acre project—called Pueblo Gardens—was designed by Architect A. Quincy Jones and stresses outdoor living. There is one glass wall in each living room.

cuts costs slightly, and mortgage policies don't tighten too much, it may well pick up again to match 1948 in volume.

Private construction holding up

Of private construction the two biggest sections are industrial and public utility facilities. Industrial building in 1948 will total about $1.4 billion, while the public utilities all together will do some $2.5 billion worth of construction.

Industrial construction, after spurting in the early postwar years, has been declining. This doesn't mean that industry's overall capital expenditures are tapering off this year. It reflects, rather, a trend in which a bigger and bigger share of business's investment dollar has been going for equipment. Today, particularly, business is inclined to put its money into equipment, which can pay for itself in a few years, rather than into plants which have to pay off over 20 years or so. So, industrial building will fall off again slightly in 1949.

Public utilities, however, will offset that by increasing their budgets. Similarly, commercial building—warehouses, lofts, office buildings, and stores—is sure to gain in 1949. Commercial building now runs about $1.4 billion, may increase several hundred million next year.

The number of churches, schools, institutions, hospitals, hotels and miscellaneous other buildings going up has been gaining fast, too. The value of churches being built, for example, is running some 90 percent ahead of last year.

All this means that private construction is likely to hold its own in 1949, despite declining industrial construction. It will total $6 billion-plus.

Public works gaining

Public construction, meanwhile, is picking up. It will run to better than $4 billion this year, making it nearly one-quarter of all construction.

It is expected to rise substantially next year—and to hit new levels in the years ahead. The country's accumulated needs for public works—highways, sewer and water systems, schools, hospitals and institutions, and conservation and development programs—have been estimated to be on the order of $100 billion.

Since the end of the war, public works has been held down by shortages of materials, heavy construction equipment and labor. The engineers have had more money than they could spend—an unusual situation.

Next year public works is expected to jump from about $4 billion to close to $5 billion. That—added to the prospect for private work and housing—gives an estimated volume for all construction of close to $19 billion, as compared to $18.5 billion this year.

Danger signal

Rising costs are a considerable problem for the industry. They've been going up faster than have incomes, residential rents or profits. That means they're out of line with the general ability to pay for new building. As a consequence, there may be a check on demand early in the year, a hitch in the flow of contracts, and some slowdown in construction activity. But it would take only a comparatively slight cut in costs, a little loosening of lending policies, and perhaps further easing of rent control, to pick up the momentum again.

But in 1950—or thereabouts—the industry will have to make a dramatic slash in costs to keep on going at capacity.

PERSPECTIVE . . . .

Prefab performance and prospects

Prefabrication is more an influence than a physical factor in house production today.

Of 950,000 dwelling units being completed in 1948, only about 40,000 came out of the plants of recognized manufacturers. This five percent contribution could be disregarded except for one thing: it keeps alive a concept that will gain strength as price resistance of buyers increases.

Prefabrication is an elastic word. It covers everything from precut, packaged lumber to shop-assembled house sections of a size for highway haulage. Within the last decade, some of its outstanding economies have been achieved by on-site prefabrication, where a contractor makes up identical assemblies for a number of dwellings on one project. Established producers insist that only a house constructed of factory fabricated sections should be called a prefab.

Because the word prefabrication has become a rubber blanket, some recent entries into the field have coined a new one—the machine-made house. These manufacturers regard themselves as the real exponents of mass production; their technique calls for heavily tooled, expensive plants to turn out fabricated parts manufactured to interchangeable precision and packaged for quick assembly on a prepared foundation. A number of the newcomers work with metals—materials that have a rich background of mass production techniques.

The problems that plague the industry are still money and merchandising.

Main advantage—and probably greatest influence—of the continuing prefab program is the fact that engineering refinement and close control of the product gives the prefab an advantage over the structure put up by the small scale builder of conventional homes. This is particularly true when materials and labor shortages hamper on-site construction. However, the public has not been educated to see the engineering quality of the prefab house as produced by a reputable manufacturer and erected by his responsible dealers.

Another advantage is that the industry is learning that real economy requires factory production of mechanical features — plumbing, heating and wiring — as well as the house shell.

Main problem for prefabs is to bring the cost of their product lower than conventional structures. Small production and slowness of dealer-erectors to embrace new methods have been given as excuses for failure to meet the lower price. Until the market stiffens and buyers offer real sales resistance, the prefabs probably will not meet their cost-reduction test. But the increasing vigor of their postwar development gives a glimmer of hope that they will be able eventually to show something, pricewise.

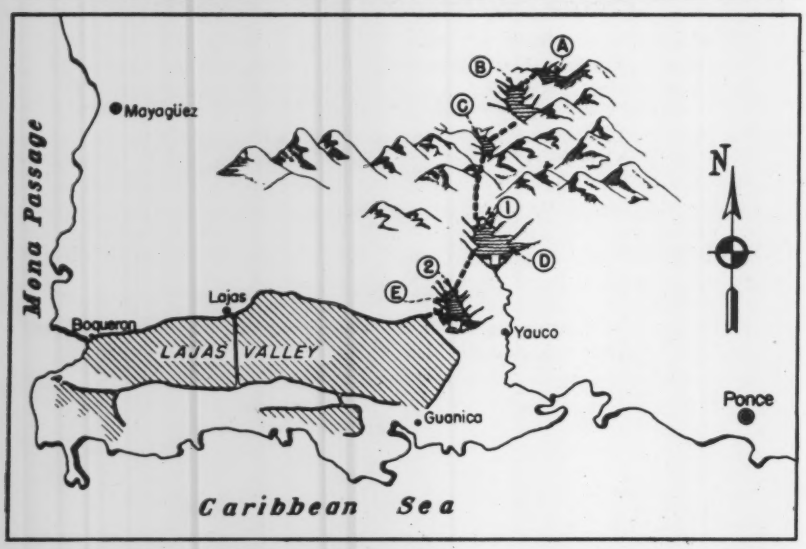
Clarify early report on engineer deferments

The story on draft deferments in *ENR* Sept. 2, p. 73, claimed too much.

At the time it appeared deferment of professional engineers—on an individual and not on a collective basis—was definitely established. But the story failed to state that detailed regulations on occupational deferments were expected in about a month, thereby implying blanket deferments.

Actually they are not out yet. A NSRB review of the situation has shown that so few men would be involved—within the age limits—that specific deferment regulations by type of work would mean little and probably would only complicate the administration of selective service. The best opinion now is that no regulations naming specific occupations will be issued.

FOREIGN DEVELOPMENTS



PUERTO RICAN POWER DEVELOPMENT and irrigation of the island's southwest corner will be accomplished by a system of reservoirs, tunnels and power stations. Plans call for collecting heavy rainfall north of the Insular Divide in reservoirs at A, B and C. Water will be brought to power installations 1 and 2 on reservoirs D and E, then to the Lajas Valley for irrigation.

Puerto Rico—Faced with the problem of more intensive cultivation of its crops to meet outside competition, particularly in sugar cane, the insular government has taken another forward step through approval of the Southwest Puerto Rico Project.

With the purchase of materials and equipment already begun, work will soon be under way for the irrigation of between 25,000 and 30,000 acres of semi-arid land in the Lajas Valley and surrounding areas. The largest strip to be irrigated lies between Boqueron and Guanica in the southwestern part of the island.

In order to justify a capital investment of $24,000,000, as well as to supply water and power facilities to surrounding towns and cities, a combination hydroelectric, irrigation and water supply project is planned. It is estimated that it will add 100,000,000 kwh. in the average year, 6.5 mgd. of potable water, and about 35 percent more area to the lands now irrigated in Puerto Rico. The project is a major part of long-range plans to raise island living standards.

Mountain rains collected

The Southwest Puerto Rico project follows the overall pattern of other hydroelectric and irrigation works on the island. Water will be collected in the mountains that divide the island in an east-west direction. Here annual rainfall averages between 80 and 100 in. a year, as against 30 in. for the relatively dry southern coast. Run-off will be collected from 70 square miles of mountainous drainage area located for the most part northeast of the Lajas Valley.

Present plans, formulated by the Puerto Rico Water Resources Authority, call for the water to be carried through the east-west divide by means of 43,400 ft. of tunnels. A gross power head of 900 ft. will be developed at the first hydro plant before the water enters a storage reservoir on the Yauco River. It will then be diverted through a pressure tunnel 15,300 ft. in length to a second plant on the upper reach of the Rio Loco Reservoir. This plant will operate with a 340-ft. head. The power flows are estimated to produce annually about 65,000,000 kwh. and 32,000,000 kwh. at the upper and lower plants, respectively.

In addition to the two hydroelectric plants, the project will require the construction of five dams, ranging in height from 60 to 200 feet; the driving of 58,700 ft. of tunnels; and the laying of 1,300 ft. of pressure pipe lines.

Irrigation is final use

After utilization at the second power station, the total water yield, supplemented by eight square miles of the Rio Loco watershed, will flow by gravity to be used to irrigate the Lajas Valley area. The irrigation project will require 25 miles of main canals and pipe lines, 19 miles of main drainage canals and the installation of three small pumping stations.

In addition to the land to be irrigated between Guanica and Boqueron—twenty miles long and five miles at its widest—smaller areas between Ponce and Mayaguey will also benefit. Most of the land to be reclaimed through the Southwest Puerto Rico Project is planted in cane. Estates from a few to several hundred acres, now relatively unproductive because of played out soil, should have a capacity of between 40 and 60 tons of sugar per acre once they are properly irrigated. Of the 32,000 acres under cultivation in the Lajas Valley and surrounding area, only 10,400 acres have any irrigation.

Belgian bridge

Belgium—Reconstruction is nearing completion at the site of one of the most spectacular bridge demolitions carried out by the Germans during the war. The structure is the Moresnet Viaduct, longest and highest on the Belgian railway system. Located a few miles west of Aachen, Germany, near the point where the frontiers of Holland, Germany and Belgium intersect, the viaduct consisted of twenty-two 157-ft. truss spans, spanning a valley on piers 164 ft. high. Four piers were reduced to rubble by demolition charges, and one or both ends of eleven spans were dropped to the valley floor. At the present time, the piers are rebuilt and seven of the spans have been repaired and raised.

Structural engineering

Belgium—A "prefabricated" prestressed concrete factory building, covering 350,000 sq.ft., was one of several remarkable developments reviewed and discussed at the Liege meeting of the Congress of the International Association of Bridge and Structural Engineers.

More than 500 delegates, representing 28 countries, attended the quadrennial session. The meeting was the first since the Berlin meeting of 1936.

The "prefab" factory—one of many viewed or discussed by the delegates as they apprised each other of sometimes startling new methods and procedures—is located in the city of Ghent. The building has spans of 70 ft., erected from prefabricated concrete units. Except for roofing slabs that were bought from products manufacturers, the structure was prefabricated on the job with the use of only half a dozen steel forms.

Another notable construction feat relates to construction of the new hangars for the airport in Brussels, these build-

ings having spans of 170 ft. Hollow girders weighing 300 tons, 10 ft. deep and 170 ft. long, concreted and prestressed on the ground, were jacked up 33 ft. in short lifts.

Of the six meetings, two were devoted to structural steel, dealing with progress in welding, truss connections and plate girders, and with wide span steel bridges. Two meetings were dedicated to the progress of reinforced concrete, during which papers were presented by E. Freyssinet of France and Professor Magnel of the University of Ghent and by Belgian and Scandinavian engineers. The second concrete meeting was devoted to flat slabs, shell roofs, and the theory of arched dams.

One entire session was devoted to the safety of structures as to impact and dynamics and the last meeting was a free discussion of all subjects.

At the close of the meeting, one of the U. S. delegates, L. Coff, New York City, consulting engineer, proposed establishment of an office for international exchange of pending structural research. This proposition was accepted and is now being implemented.

On the invitation of the British government, the next Congress is to be held in London, in 1952.

Industrial developments

India—Biggest construction job actually under way in India—and probably in all southeast Asia—is the 350,000-ton ammonium sulphate fertilizer factory now going up near Sindri, 175 miles northwest of Calcutta. Scheduled for completion in 1950 it will cost approximately $50,000,000.

The new plant has a double importance. It will supply India's impoverished soil with much needed fertilizers in an unprecedented volume, and its project represents the Indian government's first major entrance into the field of heavy industrialization with a state-owned and operated factory.

Because of the rainy season, storage of the final product to insure continuous operation of the factory was a major problem. As a result, a huge air-conditioned silo is being built to store up to 90,000 long tons. It will be an arched reinforced concrete structure, 660 ft. long, 140 ft. wide at base, and 80 ft. high at the top of the arch. Also under construction is a housing colony to accommodate the 2,500-man permanent staff which will run the factory, plus temporary quarters for construction workers who will bring the total labor force to a peak of 5,000 some time next year.

The large number of construction workers is due to the far greater proportion of work done manually, compared to practice in other countries. An example of this was the preparation of the factory site. Roughly 750,000 cu. yd. of earth were moved or excavated. It was all done manually, and it took an average daily strength of 700 men 21 months to complete.

Modern large construction equipment would be a remedy, but is not feasible in India. Engineers at Sindri point out that jobs which would require such equipment often are thousands of miles apart, and they say that the problem of transporting such equipment from one location to the other is almost insurmountable.

Wide World Photo

BRITISH BLAST FURNACE BEGUN —Foundation work begins at Port Talbot and Markham in South Wales on Europe's largest blast furnace. The whole expansion project will cost upwards of $240,000,000, and be completed in 1951 for operation by the Steel Company of Wales.

Transport

England—Strengthening its organization is the primary objective of the European and Eastern Hemisphere Division of the International Road Federation, representatives of four European nations said recently.

Assistant Director Lt.-Col. K. E. Boome left here on a tour of Australia, New Zealand, Pakistan and Ceylon in an effort to gain the support of locally-established road federations in all these countries. On the return of Col. Boome around the first of the year, Director B. O. Masse will in turn take a tour of Africa with a similar purpose.

Present members of the European and Eastern division are England, France, Holland, Sweden and Switzerland. The aim is to expand the present five-nation membership in order to implement the federation plan to have on its council at least two representatives from member-nations in each of the four continents: Europe, Africa, Asia, and Australia.

Objective of the I.R.F. is to work through the national federations, rather than go over their heads. Financial support that is evoked is channeled into these local bodies.

Turkey—H. E. Hilts, Deputy Commissioner of Design of the Public Roads Administration and head of the PRA group of experts who have already rendered service as advisers to the Turkish government, is returning to Turkey. On the invitation of Minister of Public Works Nihat Erim, Mr. Hilts will spend a month touring various areas to inspect progress on the program of development of Turkey's national system of roads (*ENR* July 15, p. 4).

Excellent progress is being made in construction of the important Iskenderun-Erzurum highway. A U. S.-equipped laboratory has been set up by the Turkish Minister of Public Works to determine which types of road surfacing are best suited to the different kinds of top soil found in various parts of the country.

Pakistan—A 133-mile, $12,000,000 canal linking the jute-growing areas of East Bengal with the port of Chittagong has been approved by the Pakistan government, with the aim of permitting direct export of the product which traditionally has been shipped from the port of Calcutta.

Miscellany

Argentina—The Argentine government has authorized the duty-free importation of all construction materials. The ruling will take effect immediately. This action is aimed at overcoming difficulties which have heretofore hindered the building program in this country.

Puerto Rico—During the first six months of 1948, the number of construction permits issued by the permit official was valued at $13,500,000, an increase of 50 percent over the same period of 1947, when construction permits amounts to $9,000,000.

Australia—Tubular telephone poles, light masts and gate and fence posts are made in Australia of galvanized steel sheet. Advantages claimed over wooden poles are ease of anchoring in the ground, resistance to rot, low weight and reduced shipping space (by stacking poles one inside the other), ease of climbing as slots are provided, and ease of installations, due to factory-made holes which make drilling unnecessary.

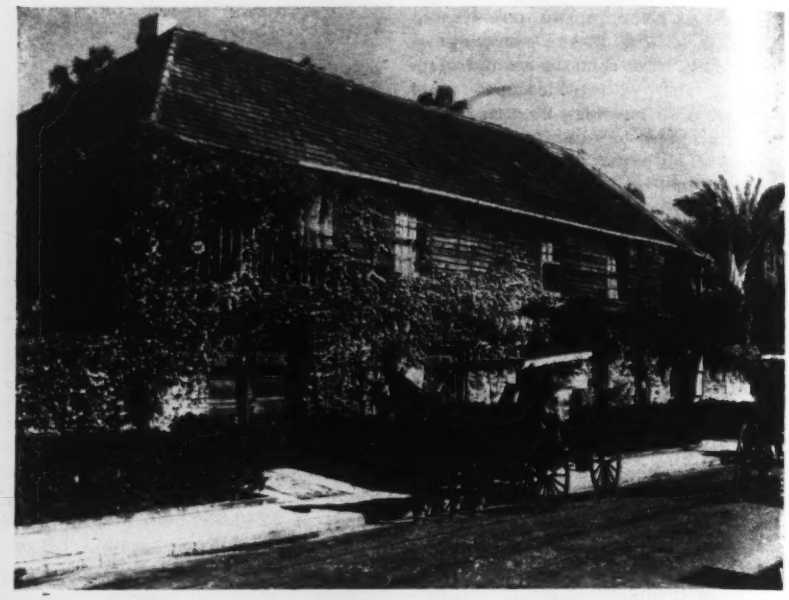
Ancient buildings in St. Augustine reflect good design and construction

Engineers traveling in the early-settled parts of the United States frequently encounter ancient structures whose intriguing construction, over and above any historical interest they may have, excites their curiosity and interest. Three such structures exist in St. Augustine, Fla.—a dwelling, a wooden school house and a fort.

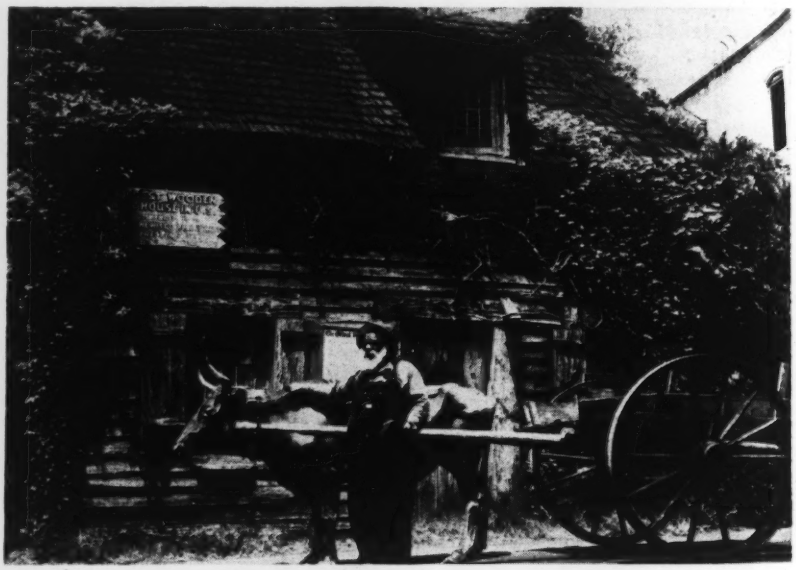
Believed to be nearly 350 years old, the dwelling is in an excellent state of preservation. In 1599, according to traditional accounts, it had been used as a chapel by Franciscan friars, and later, during the British campaign to drive the Spaniards from Florida, it had served as a hospital. An upper story of wood was added by British owners in the 18th century.

Cellarless, the old house has a 2-ft. thick "tabby" concrete floor resting on sandy soil. The concrete in the floor was made by wetting equal parts of sand, shell and lime with salt water and hammering the mixture down until it no longer stuck to the hammer. When dry, it was coated with linseed oil. According to the 18th century surveyor, von Brahm, "It has a finish like marble." In 1947, the finish hardly resembles marble, but the concrete is still extremely hard and durable.

Supported on the floor, the 17-in. thick walls are composed of small stones laid with lime mortar and sand, reinforced with Florida red cedar (juniperus barbadensis) uprights, and coated with a mixture of shell, lime and sand. Wall surfaces on both the interior and exterior are faced with pure lime plaster.



WOODEN HOUSE on St. Francis street is believed to be nearly 350 years old—the oldest dwelling in the nation. Upper story was added in the 18th century.



CENTURIES OLD—This school house on St. George street is built of cypress and red cedar. In 1790 it was referred to as "in fair condition".

Old school well preserved

In contrast, the old school house on St. George St., believed to have been built more than 200 years ago, is constructed of cypress and red cedar. Supporting the opinion of its antiquity is a report made by Juan Yenoply in 1790, which referred to the school as, "Wood house in fair condition." The old school with a minimum of repairs is still a useful structure.

As in all early Spanish architecture, the front is flush with the roadway, allowing a spacious patio behind. At the rear of the central structure is a lean-to that appears to have been designed to brace the main building against wind. Cedar pegs were originally used instead of nails, but here and there antique blacksmith nails now supplement the pegs; few modern nails have lasted even half a century in repairs. The original native-oyster shell-type whitewash may still be seen on some of the red-cedar support beams.

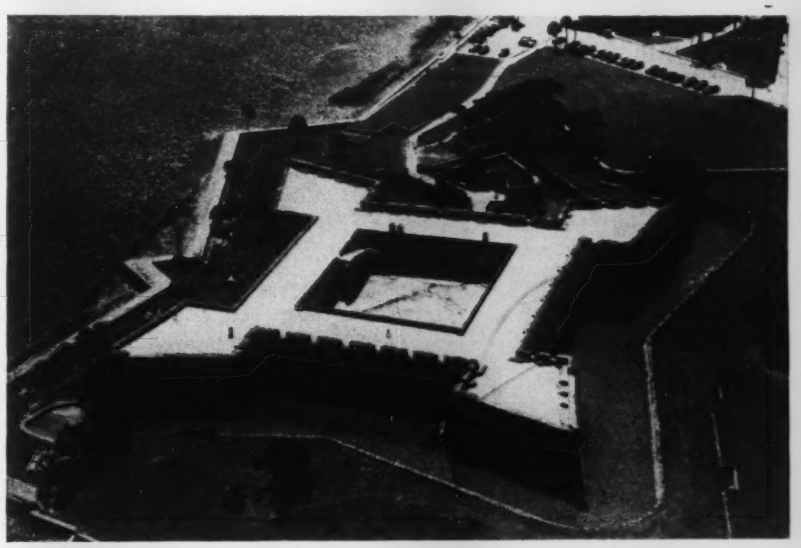
Shingles were fashioned by hand with a frow from cypress logs so that each one contained four or five lines of growth rings running its length. The winter-hardening substance of these growth lines makes the roof impervious to water. The heart of the cypress log was discarded in making shingles.

Still a third material shows remarkable durability. Castillo de San Marcos, the oldest masonry fort in the United States, was built about 1672, entirely of coquina and coquina compounds, natural lime rocks composed of broken seashells cemented together with their own lime. Though it rests on a sand base below sea level, the fort has

not suffered serious cracking or crumbling.

In its day, Castillo de San Marcos was the largest single structure in America. The combat deck is surfaced with a 6-in. thick coquina-concrete floor on more than 2½ ft. of solid masonry, except on the ocean side where the minimum thickness is about 4 ft. since attack was expected from this direction. Stone-arch caverns, entered from the court, provide several "bombproof" rooms under the masonry deck. Access to the combat deck is provided by a heavy stone ramp, the upper part of which is supported by a parabolic arch. The tread of the ramp is a flat arch three stones wide, each stone being about 3 ft. wide and 18 in. thick.

The fort is the property of the federal government and is now under the administration of the National Park Service. The dwelling is owned by the St. Augustine Historical Society and Institute of Science and the school by State Senator Walter B. Fraser. All are open to the public.



CASTILLO DE SAN MARCOS, the oldest masonry fort in the country, was built about 1672 of natural lime rocks composed of broken seashells cemented together with their own lime. "Bombproofs" under the deck open to the court. Once this was largest building in America.

Tunnels are taxable, Canadian court rules

Power tunnels are more than holes in the ground, and are taxable improvements is the ruling of the Supreme Court of Canada.

The court upheld the British Columbia government's right to tax property owned by three power companies, reversing a decision of the B. C. Court of Appeal and confirming a decision of the B. C. Court of Revision.

The companies are the Bridge River Power Co., the Vancouver Power Co., and the Burrard Power Co., all subsidiaries of the B. C. Electric Ry. Co.

The appeal to the Supreme Court involved five power tunnels upon which assessments totalling $1,938,643 had been placed by E. A. Dickie, Vancouver barrister, sitting as a court of revision.

In a review of the assessments, Justice Manson, of the B. C. Supreme Court, had ruled the tunnels were "holes in the ground" and not taxable improvements. The B. C. Court of Appeal confirmed his finding.

Assessments which have been upheld are: $1,047,000 on the 2½-mi. tunnel from Bridge River to Seton Lake, in the new power project due to open late in October; $472,330 on the Coquitlam-Bunzten Lake tunnel; $16,485 on Bunzten Lake No. 1 pipe tunnel; $155,422 on Bunzten No. 2 pressure tunnel; $247,406 on Alouette-Stave Lake tunnel.

Transformers and equipment at Bridge River included in the appeal were ruled non-taxable.

Canadian firm builds aluminum traveling crane

Provincial Engineering Ltd. of Niagara Falls, Ont., has been awarded a contract for the construction of an aluminum-welded electric traveling crane.

The crane will have lifting and test capacities of 15 and 22½ tons, respectively, and a span of 60 ft.

All structural work on the crane, and other components as far as possible, will be made from high tensile aluminum alloy extruded and rolled sections, which have a strength approximately equal to that of steel and a weight about one-third that of steel.

As the weight of the crane is reduced, it is possible to increase the lifting capacity accordingly without any increase in gross load. In certain cases it has been possible to double the capacity of a crane (without the necessity of reinforcing existing structural supports in a building) by using aluminum instead of steel. The building economy affected may make the cost of the crane of secondary consideration.

Faster acceleration and deceleration can be obtained so that the lighter crane can be spotted and handled more quickly, and consequently power consumption is lower.

The fact that aluminum does not rust or scale under ordinary atmospheric conditions, that it is highly resistant to the corrosive action of certain chemicals and does not require painting will make possible lower maintenance costs.

Army earmarks $87 million for '49 construction jobs

More than half of the $151,000,000 approved for military construction in 1949 by the last Congress (*ENR* July 1, p. 2) will go into 87 projects announced recently by the Departments of the Army and the Air Force.

Most of the new work, which has a total value of $87,853,364, will be for construction of 1,933 housing units to relieve a critical housing shortage at Army and Air Force posts. Over $39,000,000 will be expended on projects in the continental United States, and $48,261,486 will be for work overseas. All construction will be under the supervision of Lt. Gen. R. A. Wheeler, chief of engineers.

The 1,933 new housing units are in addition to 941 units announced on Aug. 6, bringing the total so far announced to 2,874 for both the Army and the Air Force. Most of the units will be two-story, multiple-unit types, and there will be six to eight units in a single building.

Other new projects the army engineers will build in their military construction program include: runways, aprons and operations building at the Rapid City Air Base, S. D., $5,000,000; barracks at Ladd Field, Alaska, $4,631,800; barracks at Ft. Richardson, Alaska, $3,956,000; rocket test facilities, control tower and speed course, Muroc Air Base, Calif., $2,878,000; and laboratory and test facilities at Wright-Patterson Field, Ohio, $1,051,000.

MUNICIPAL AFFAIRS

The development of master plans covering sewage disposal, highways and slum clearance occupied the attention of city leaders last week in Seattle, Wash., Salt Lake City, Utah, and Philadelphia, Pa.

Seattle should develop a master plan for progressive sewer extension and controlled sewage disposal that will include the areas adjacent to its city limits, Mayor William F. Devin was told in a report by Abel Wolman of Johns Hopkins University, retained a year ago to survey the city's sewage disposal system.

Certain inadequate conditions can be "economically and safely met without recourse to elaborate artificial treatment of Seattle sewage," Dr. Wolman asserted, since Puget Sound, into which much of the city's sewage is emptied, "has such a tremendous capacity for assimilating the municipal wastes that it would not only be uneconomical but quite foolish not to take advantage" of it. Puget Sound is of excellent sanitary quality both above and below the city, the report declared, being deep and cold and having swift tidal currents.

However, the report said, conditions are unsatisfactory in certain areas of the Sound. As a remedy, it recommended extension of all trunk sewers into deeper water. The north trunk sewer should have two outlets and be re-designed so as to provide sufficient capacity to discharge at not less than 75 ft. below mean low water either by gravity or auxiliary pumping three times the dry weather flow of the area it drains. Provision also should be made for early installation of units for "fine comminution of all sewage before discharge into the Sound", he declared, with ultimate installation of plain settling as growth of population demands.

At Salt Lake City the planning and zoning commission recommended the first major changes in the city's master road plan in five years. Features of the plan are a new divided-lane expressway seven miles long to route north-south traffic through the outskirts of the city, and a new approach highway of half that length to bring U. S. Highways 30 and 40 into Salt Lake City over a congestion-free route from the mouth of Parley's Canyon.

The plans were drawn by City Planning and Zoning Engineer C. G. Wooley for submission to the city commission. However, with the local government already studying the feasibility of a $10,000,000 bond issue for badly needed water facilities, schools and other minimum improvements, there is some doubt as to when a start may be made on the highway plans.

The proposed changes would bring up to date recommendations made in 1943 but never adopted.

The West Side Expressway would bypass traffic now using U. S. 91 through the city. Traffic would be detoured 33 blocks south of the heart of the city, using a roadway swinging west to avoid rail terminals and the downtown area. It would rejoin U. S. 91 between Salt Lake and Ogden 3 miles north of the business district.

The planning board also recommended construction of a four-lane trans-county highway. Such a road would utilize the line of the present South 23rd East St., now badly congested, and would also draw traffic from the heavily-traveled Highland Drive.

Pennsylvania has been urged to set up a $10,000,000 fund to assist municipalities in wiping out blighted areas and to further other city planning projects. Earle N. Barber, chairman of the Philadelphia Redevelopment Authority estimated that city's share of the proposed fund at $2,500,000.

Parking Matters

Increasing trends toward forcing businesses that create traffic congestion to provide their own off-street parking facilities were reflected in a series of ordinances reported last week.

For example:

A lot on which any business is established in Dayton, Tenn., must also provide vehicle standing space equal to not less than 15 sq. ft. for each 5 ft. of street frontage of the lot.

Space for the parking or garaging of at least one non-commercial vehicle must be provided on each lot on which a family resides is the rule in Bremerton, Wash.

In Quincy, Ill., commercial buildings must provide permanent parking spaces on their lot in the ratio of one parking space for each 200 sq. ft. of floor space in the building. Tucson, Ariz., requires places of public assemblage to provide 200 sq. ft. of parking space for each five permanent seats. Churches must provide the same amount of space for every 10 seats. Miami, Fla., hotels are required to provide one parking space for every 500 sq. ft. of sleeping room area.

A bond issue was proposed in Baltimore, Md., to advance money to parking lot owners and others for expansion either by adding property to existing lots or building decks on garages. George E. Finck, assistant director of public works, explains that the city is not going into the parking business, but would create a "pump-priming fund" to spur off-street parking projects by loans at from two to four percent interest.

Oakland Civic Center

The first step in the construction of a civic center for Oakland, Calif., was made with the awarding of a $1,211,000 contract to Stolte, Inc., Oakland contractor, for a main library building. When completed the center will contain city, county and state buildings and will cost an estimated $15,000,000. All three government agencies are buying property in the area.

The library will be financed through funds approved by Oakland voters in 1945. Another 1945 bond issue set up $2,700,000 for a hall of justice. City officials expect contracts for this project to be let about July 1 of next year.

Cities Annex Suburbs

Winston-Salem, N. C., recently annexed nearly 2,000 acres of unincorporated suburban area, with a population of about 5,500, in one of a series of moves by municipalities to extend their borders.

Louisville, Ky., recently annexed 896 acres. The action resulted in complete encirclement by the city of two lesser municipalities—Seneca Gardens and Seneca Vista. Louisville supplies gas, electricity and other services to both.

Stockton, Calif., annexed 130 acres containing 1,120 residents.

Florence, S. C., recently doubled its corporate area, adding some 8,000 to the population, bringing it to about 25,000.

Baton Rouge, La., accomplished consolidation with East Baton Rouge Parish last year by adopting a zonal arrangement whereby a rural zone receives and pays for only minimum services.

Toledo Improvements

A tentative two-year $25,000,000 improvement program for Toledo, Ohio, has been submitted by Arnold V. Finch, city engineering commissioner, to include street and sewer improvements, bridge construction, and grade crossing separation. The city's portion of the cost would be $2,463,280, most of which would be provided if voters approve a proposed amendment to the payroll-income tax ordinance. The rest would come from regular gasoline tax and license revenues, and state and federal grants.

Plans are either completed or can be completed in time to permit construction within the time specified.

Prefabs in Boston

Boston, Mass., has eased up on its building code and this month prefabricated steel houses are making their first appearance in New England on a tract in the West Roxbury district. The Lustron Corp., Columbus, Ohio, is the maker. A five-room house will be delivered to the site in big porcelain-enamel steel panels, to be erected in two or three days, and opened to the public as a model, furnished dwelling ready for occupancy.

Although the loopholes provided in the Boston code to permit steel house construction are only temporary, it is believed that public acceptance of the houses may clear the way for a permanent change in the building code.

Airport Plans

As municipalities endeavored to get federal aid for airport projects airport planning has gone on apace, reports last week indicated.

George S. Armstrong & Co., which recently completed a state-wide airport survey for Rhode Island, has been engaged as consultant to The Airport Designers of New Haven to prepare a master airport plan for that city.

The board of supervisors of Chemung County, N. Y., has engaged McFarland & Brown to prepare plans for and supervise extension of the northeast-southwest runway at the County Airport.

The Logan International Airport in East Boston, Mass., has added seven pieces of heavy snow-fighting machinery to its equipment. Snow-fighting cost the management $75,000 last year. About 8,500,000 sq. ft. of runways must be cleared after a storm. Each of the 15 snow trucks is equipped with a one-way radio so that the operators can be in touch with the control tower and keep out of the path of the planes coming and going.

Cincinnati, Ohio, is voting on approval of a $6,000,000 bond issue for construction of the proposed Blue Ash Airport. The city council has set up a fund in bonds for land. The federal government is expected to provide another $6,000,000 for the project.

Defiance, Ohio, county commissioners were authorized Oct. 20 by E. H. Schofield, Columbus, district engineer of the Federal Civil Aeronautics Administration, to advertise for bids for a 3,000-ft. paved runway at the Bryan-Defiance Airport.

A longer east-west runway, to cost $600,000 to $700,000, will be built next year at the Albany, N. Y., Airport, according to plans now nearing completion. This will be the second phase of the airport's expansion.

Cleveland, Ohio, has awarded a $1,472,672 contract to Loesch & Green Const. Co. for a concrete runway at the municipal airport.

Thanks to a million-dollar dike, partly completed, on Oct. 6 for the first time in four years, a high tide driven by a northeast wind failed to flood LaGuardia Field, New York City.

Worcester, Mass., is to seek authority from the state legislature to borrow $1,000,000 for completion of its municipal airport. Federal and state grants may add another $1,500,000.

Acme Photo

RUBBER STREET FOR RUBBER CAPITAL—Akron, Ohio, has used powdered rubber furnished by Goodyear in a hot mix spread at a busy intersection. (*ENR* Sept. 23, p. 8) This ingredient, already used in Holland and England, is supposed to lessen the danger of skidding.

Municipal Briefs

Kansas City, Mo., has just issued its largest building permit—for a $5,478,000 addition to John Taylor's department store.

City council of Boston, Mass., for the second time, has blocked construction of a $30,000,000 subway project until it gets more information as to costs and financing.

Wrecking operations have begun at Milwaukee, Wis., on the site of the new auditorium sports arena.

Bids are being asked on the 3,300-ft. tunnel section of the South Omaha, Neb., sewer.

Long Beach, Calif., seeks authority to open a new 23-acre fill-and-cover rubbish disposal area in the Artesia section. Improvement associations oppose the plan on the ground that it would depress real estate values and contaminate water supply. The state health officer will rule on the dispute.

Piedmont and Jacksonville, Ala., have awarded the first contracts in a natural gas expansion program by Alabama municipalities which eventually will cost about $30,000,000.

City Planner Geo. W. Simons, Jr., rates city-county consolidation above annexation as the solution of the suburban problem of Tampa, Fla.

Maintenance and operation of the park system of Fort Wayne, Ind., in 1947 cost the people of the city $1.70 each, with playgrounds and recreational program another dollar, according to a report of H. L. Van Gunten, superintendent of parks.

Tampa, Fla., has thrown out all bids on one section of the $1,458,000 waterworks extension project and called for new bids. This is the result of a controversy raised by Tampa contractors when a New York firm placed a low bid of $264,830 for the work.

Arnold V. Finch of the city engineering commission of Toledo, Ohio has outlined a tentative 2-year, $25,131,730 program of street and sewer improvements, bridge construction, and grade crossing separation for the city. It has been recommended for approval by the public works committee.

Appointment of 26 leading citizens of Buffalo, N. Y. to the newly authorized special committee on capital expenditures and priorities of the common council has been announced by Council President Peter J. Crotty. The committee will draft a capital expenditures program, including schools, waterfront, bridges and other capital assets.

Public works officials and engineers in the various city departments of Philadelphia, Pa., are expected to have any inequities in salaries adequately adjusted by the Committee of Fifteen now investigating the entire municipal setup.

Start on $40 million Bronx expressway soon

Work on the $40,000,000 Major Deegan Expressway in the Bronx, New York City, will start by the beginning of the year. The first construction contract for the six-lane, eight-mile project will be bid on this month. The expressway will follow the Harlem River northward from the present end of Deegan Boulevard at 138th St. and the Grand Concourse to Kingsbridge Road. Then it will continue through Van Cortlandt Park to join Central Avenue at the Westchester County line.

Financed with matched state and federal funds, the construction will be coordinated by Bertram D. Tallamy, superintendent of the State Department of Public Works. Clarke, Rapuano and Holleran; Howard, Needles, Tammen and Bergendoff; and Robinson and Steinman were three local firms consulted in the planning of the project.

The southernmost section, which will complete a direct link between the Triborough and George Washington bridges, should be completed by 1951. The remainder of the job would take an additional three years, at least, since relocation of homes will be required.

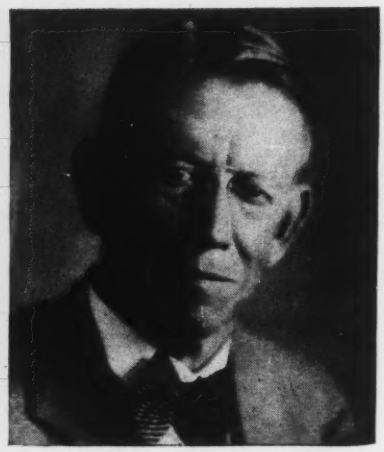
Meanwhile, work progresses on the cross-Bronx link between the Whitestone Bridge and Major Deegan Expressway.

N. Y. City public works men get sanitation posts

As a result of a recommendation of the New York City Mayor's Committee on Administration, two sanitary engineers from the department of public works have been transferred to important posts in the department of sanitation. Harry Leibman has been named director of operations and Casamir A. Rogus has become director of the bureau of engineering in the sanitation department. Mr. Rogus was formerly a project manager in the public works department.

W. A. O'Leary replaces Mr. Leibman as chief of the bureau of sewage-disposal design in the department of public works. Also appointed to new positions in this department are: Sigvald W. Steffensen and Joseph Cunetta as deputy chief and project manager, respectively, in the bureau of sewage-disposal design; and Viggo Westergaard, project manager for refuse-destructor plants.

These promotions were made on the recommendation of Frederick H. Zurmuhlen, commissioner of the department of public works, who is a member of the mayor's committee.



Daniel W. Mead, educator and consultant, dies

Daniel W. Mead, emeritus professor of sanitary engineering at the University of Wisconsin, whose death was noted last week, began his teaching career over 40 years ago when he already had built a reputation as a practicing consultant in hydrology, sanitary engineering and waterpower development.

Born at Fulton, N. Y., in 1862, and graduated from Cornell University in 1884, Mr. Mead served successively as a topographer for the U. S. Geological Survey, city engineer of Rockford, Ill., and then as chief engineer and general manager of the Rockford Construction Co. for ten years, during which time he began to practice as a consulting engineer on water supply work. By 1877 he was devoting all his time to consulting.

In 1904 when the authorities at the University of Wisconsin decided to set up hydraulic and sanitary engineering as a separate department, Mr. Mead was asked to take over its direction. He accepted on condition that he could devote part of his time to continuation of his consulting practice. Included during his active teaching period was service as consultant to the Miami Conservancy District, the engineering board for flood control on the Hwai River in China, the Colorado River Advisory Board of Engineers, and chairman of the Board of Review for the PWA on plans of the Chicago Sanitary District.

Much of Prof. Mead's time in the years immediately following his retirement was given over to the affairs of the ASCE—especially in behalf of younger members. He was elected to honorary membership in 1931 and as president in 1936.

Prof. Mead was author of books on hydrology, water power engineering, hydraulic machinery, engineering contracts and specifications.

C. P. Berkey, geologist awarded first Kemp Medal

The first award of the Kemp Medal "for distinguished service in geology" was awarded on Oct. 26 to Charles P. Berkey, 81, Newberry professor emeritus of geology at Columbia University. One of the pioneers in the field of engineering geology, Dr. Berkey is an honorary member of the ASCE, and in the last three decades has been called as a consultant to study the foundations for some of the country's greatest bridges, dams and reservoirs.

Since 1906 he has served continuously as consulting geologist for the New York City Board of Water Supply on the Catskill and Delaware aqueduct projects.

Other projects to which he has contributed his counsel have included the George Washington Bridge, Lincoln Tunnel, Kill von Kull Bridge, Whitestone Bridge, Queens-Midtown and Battery-Brooklyn tunnels in New York City; Hoover, Grand Coulee, Bonneville, the TVA development and other great dam sites throughout the country; municipal water supply projects in Boston, Los Angeles and many other cities; and the St. Lawrence Waterway project.

The Kemp Medal was established in honor of the late James Furman Kemp, founder of Columbia's geology department. The award to Dr. Berkey was made by university president Dwight D. Eisenhower.

At the dinner at the Faculty Club, Kenneth C. Heald, vice-president of the Gulf Oil Corp., made a plea for military recognition of the great value of geology in the future defense plans of this country.

Turnpike authority set up in New Jersey

Appointment of a New Jersey turnpike authority with powers to finance and build a toll highway across part of the state was authorized in a bill signed by Governor Driscoll on Oct. 27. The authority is to be a three-member, nonsalaried body within the State Highway Department.

The turnpike will extend from a connection with the new toll bridge over the Delaware River now being built by the state of Delaware from near New Castle to Pennsville, N. J., northward past Camden to a connection with the superhighway, N. J. Route 100, near the Raritan River, a distance of about 100 miles. It follows along the route of one of the projected freeways for New Jersey.

ENGINEERING SCHOOLS

Research on dam design at Northwestern—New courses offered—Large enrollments at many schools

Research under way at Northwestern University, Evanston, Ill., eventually may assist engineers in the design of more efficient dams. It is also likely to develop new information on the availability of water from wells.

The project, under the direction of Prof. Philip C. Rutledge and Asst. Prof. Howard P. Hall, is being conducted in the soil mechanics laboratory of the civil engineering department at the Technological Institute on the Evanston campus.

Up to this time, the study of transient flow of ground water as, for example, the rate of development of seepage through earth dams and the rate of lowering of ground water around wells, has not been extensive. The present investigation is expected to provide a clearer understanding of what actually does take place, and should permit, not only more economical design of flood control structures, but also more reliable analysis of water supply and drainage problems. Just now, the investigation is being limited to the effects of the raising and lowering of reservoir levels behind earth dams.

To study the unsteady flow of seepage in an earth dam, the engineers have constructed a model consisting of two trapezoidal glass plates mounted to simulate the cross-section of a dam. The space between the plates is very small (about 1/50th of an inch) in order to assure slow, smooth flow. Instead of using water, however, the scientists are employing a much thicker fluid to slow down the model test so that photographic records and measurements may be made.

Conditions of sudden filling, sudden lowering, and intermediate rates of change in water elevation are simulated by mechanical control of the fluid supply. The rate at which a steady flow condition develops is measured, and from this and other data the rate of development of seepage in an actual dam may be determined.

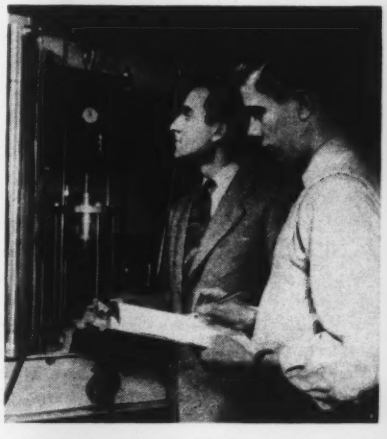
According to the investigators, the model tests using the closely spaced glass plates and the viscous fluid are a mechanical means of solving a mathematical problem which is so complicated that, to date, mathematicians have been unable to approach the exact solution.

Certain phases of the Northwestern research eventually may be of value also in an investigation of the time lag between a sudden reduction of reservoir level behind a dam and the resulting changes in pressure of the water seeping through the pores of the structure. This time lag accounts for the fact that a sudden reduction in height of water behind a dam actually reduces, rather than improves the stability of the structure.

New Courses

The widespread interest in public housing because of the housing shortage has lead to the introduction of a new course on that subject in the public service training program of the evening and extension division of the College of the City of New York. It will be taught by James H. England, executive director of the New York City Housing Authority, who supervises about 2,500 employes and a public housing program of about 76,000 apartments.

Northeastern University, Boston, Mass., in cooperation with engineering societies of New England, is offering a program of graduate engineering evening courses, including such subjects as indeterminate structures, cement and concrete technology, theory of elasticity, pulse circuits, advanced mathematics and servomechanisms. The faculty, headed by Dean William T. Alexander and Prof. Alfred J. Ferretti, includes Kentaro Tautsumi, project engineer of Jackson and Moreland, Inc., Donald P. Campbell, assistant professor of electrical engineering at Massachusetts Institute of Technology, and Professors Emil A. Gramstorff, Martin W. Essignmann and Herbert K. Brown of Northeastern's faculty. Nine outstanding engineers will give lectures on cement and concrete technology.



Learning About Soils—Students in the soil mechanics laboratory at New York University college of engineering record data on a tri-axial test which provides information concerning earth characteristics for use in foundation design and in highway and airport engineering.

A course in metallography and heat treatment will be offered by the Massachusetts Division of University Extension at the Massachusetts Institute of Technology, under the auspices of the State Department of Education. It is to give a working knowledge of the properties, treatment, uses and limitations of the common metals and alloys.

Alfred M. Freudenthal, formerly professor of bridge design at the Hebrew Institute of Technology, Haifa, and now a research and design consultant in New York, is giving a series of weekly lectures in Columbia University's school of engineering on "The Mechanics of Inelastic Behavior of Materials." During eleven years in Palestine, Dr. Freudenthal was in charge of the construction of the Tel Aviv Port, and during the war he was consultant to the chief engineer of the British forces in Palestine and Transjordan. Early in 1947 he came to this country to study developments in research relating to the fatigue of materials at the University of Illinois, where he was visiting professor of mechanics.

Departments of industrial engineering and mechanics have been established in the college of engineering at the University of Arkansas.

Registration Figures

Total registration at the Massachusetts Institute of Technology this year is more than 5,000, including 800 freshmen. The number of veterans is about 10 percent less than last year.

At Harvard University 240 students have been enrolled in the engineering school.

At Gonzaga University, Spokane, Wash., engineering students total 413 as compared with the 338 who were enrolled last year.

There are 692 undergraduate students at the South Dakota School of Mines and Technology. The school has a 10-year building plan.

A total of 7,117 students including 1,024 freshmen from Georgia and other states and seven foreign countries have registered this year at Georgia Institute of Technology, Atlanta, Ga.

At the University of Toronto there are 2,500 engineering students. It is estimated that 3,300 engineering students will be graduated in Canada in 1949, affording much relief to the shortage of engineers in the dominion.

Enrollment at the graduate school of Stevens Institute of Technology, Hoboken, N. J. is 710.

MEN AND JOBS

After 19 years as head of the Hartford, Conn., Metropolitan District Commission, **Charles A. Goodwin,** recently announced that he will leave Jan. 1, but the commission has asked him to reconsider. The commission has charge of the water system and sewage plant serving most of Greater Hartford.

With **V. E. Ashley** as president and **E. J. Strasburger** vice-president, Ashley-Strasburger Engineers has been organized at Butte, Mont., to succeed the Strasburger Civil and Mining Engineering Co. of Butte and the Ashley Engineering Co. of Coeur d'Alene, Ida.

J. B. Hayes, civil engineer, has retired from the managership of the Nova Scotia Light, Heat & Power Ltd. Halifax, N. S., and is succeeded by Cecil J. Hayes.

Robert Chiles, former Arkansas State Highway Department employee, has been appointed city engineer of Paragould, Ark.

Thomas H. Desmond, Simsbury, Conn., engineer, has been appointed superintendent of the State Park & Forest Commission to succeed Arthur V. Parker, who retired in 1947. Mr. Desmond has served the commission as a consultant for a number of years, and has been acting superintendent since June.

Harold J. Corvin, Towson, Md., has been appointed construction engineer for the Tennessee federal-aid hospital construction program. Formerly he was with the Tennessee Valley Authority as construction engineer and as superintendent at Oak Ridge, Tenn.

Lawrence T. Beck, New York consulting engineer, and **Robert Mc. C. Figg, Jr.,** attorney, for the authority of Charleston, have been named coordinators for the South Carolina State Ports Authority, an organization for development of the ports of Charleston, Beaufort and Georgetown.

Walter W. Graf, Lancaster, Ohio, has been re-appointed a member of the Ohio Professional Engineers and Surveyors Board for a term ending in September, 1953.

For the Indian government, **V. K. Paranjpye,** an engineer, has begun a two-month period of practical training with the Bureau of Engineering, Pennsylvania Department of Health. Specially interested in the treatment of industrial wastes, he was graduated as a sanitary engineer in India and is engaged by the Central Provinces and Berar government which are sponsoring his educational course in this country. He went to Rutgers University, New Brunswick, N. J., two years ago, where he took an advanced course and received his master's degree. When he requested a location to receive practical training before returning to India, William Rudolfs, of Rutgers, suggested the Pennsylvania Health Department Bureau of Engineering because of the advances made in waste treatment in a great variety of industrial operations in that state.

C. H. Nelson has been named chief engineer on construction and **Charles A. Robbins** chief engineer of maintenance, Department of Highways, Ontario. Mr. Nelson was formerly assistant chief engineer and Mr. Robbins district engineer.

W. Greenwood is now city engineer of Sarnia, Ont., having succeeded J. T. Laidlaw.

J. Robert F. Swanson, Bloomfield Hills, Mich., has been named city planner to be in charge of the master plan of the combined communities of Champaign and Urbana, Ill., and the Uni-

Daniel Lester Evans, now with the Federal Works Agency's Bureau of Community Facilities at Seattle, Wash., has been appointed King County engineer at that city to succeed William D. Shannon, who filled in temporarily. Evans was a member of the county engineering department from 1920 to 1934 and later engaged in private practice. From 1940 to 1944 he was a member of the staff of the Seattle District, Corps of Engineer, serving as chief of the Alaska operations division and chief construction engineer for the Spokane area. He is a graduate of the University of Washington.

Randle B. Alexander, former supervising construction engineer on the Houston - Galveston Expressway, assumed his new duties as Texas Highway Department bridge engineer recently, succeeding James P. Exum, now with the consulting engineering firm of Howard, Needles, Tammen and Bergendoff in New York City. Alexander is a graduate of the University of Michigan. During his 25 years with the department he has been in charge of construction on many of the major bridges in Texas. A veteran of both wars, he served as lieutenant commander in the Navy during the last one.

Rufus W. Putnam, until recently manager of the Los Angeles branch of Kaiser Engineers, Inc., has opened consulting engineering offices in Los Angeles, Calif. His organization includes chemists and bacteriologists, as well as mining, chemical, mechanical, electrical, and civil engineers for a wide range of engineering work. During the war, Colonel Putnam was district engineer for the Los Angeles District. Before he entered the Army, he was a consulting engineer in Chicago, where he specialized in harbor, water terminal, shore protection, waterway and hydraulics.

versity of Illinois. He is a graduate of the University of Michigan. He was associated with Eliel Saarinen in the multi-million plant for Cranbrook Academy, Bloomfield Hills, Mich., and recently completed a development program for Louisana State University, Baton Rouge, which was similar in many respects to the projected work in the University of Illinois community.

J. D. Rhyne, has resigned as assistant city manager at Hickory, N. C., where he acted as city manager from July, 1946, until July, 1947.

F. Ray Leimkuehler, an architect, has been appointed to the recently-created position of superintendent of building construction for the St. Louis, Mo., Board of Education under V. Harry Rhodes, Commissioner of School Building. He has been associated with the architectural and engineering firm of Maguolo and Quick, St. Louis, and in August was appointed by Mayor Aloys P. Kaufmann to serve a five-year term as the architectural member of the city's Board of Adjustment, which passes on appealed cases under the city zoning ordinance.

Willis E. Briscoe recently assumed his new duties as assistant city engineer for Kansas City, Kan., succeeding **Ben Orvis,** who retired after 40 years of city service. Briscoe formerly was city engineer for Wellington, Kan., and is a graduate of the University of Kansas. **J. O. Armstrong** is city engineer for Kansas City, Kan.

Resignation of **J. Stanley Williamson** as chief commissioner of the South Carolina State Highway Commission has brought to an end a 14-month-old controversy. **Claude R. McMillan** was elected to succeed Williamson. The commission ousted Williamson in July, 1947, and named McMillan, then chief engineer, as chief commissioner. Recently the court ruled the commission in error in the ouster proceedings and ordered the reinstatement of Williamson. McMillan then became executive secretary. Williamson had been with the highway department for 26 years, serving as an engineer, chief highway engineer and chief commissioner. McMillan has been with the department for a quarter of a century and has served as engineer and later as chief engineer.

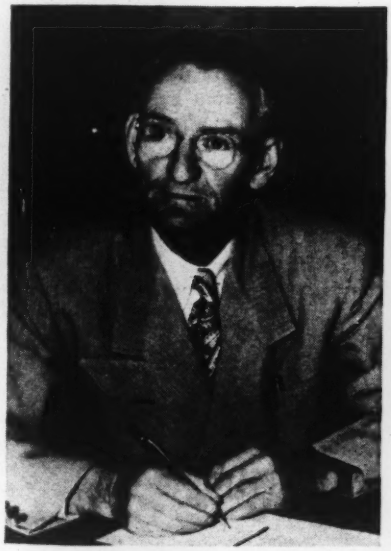
Wilfrid Tudor of Yarmouth, N.S., has been named Town Manager of Windsor, N. S.

Vincent B. Lamoureux, district engineer of U. S. Public Health Service District No. 1, New York City, has been transferred to the National Security Resources Board in Washington, D. C., and his place is taken by **James H. LeVan,** civil engineer.

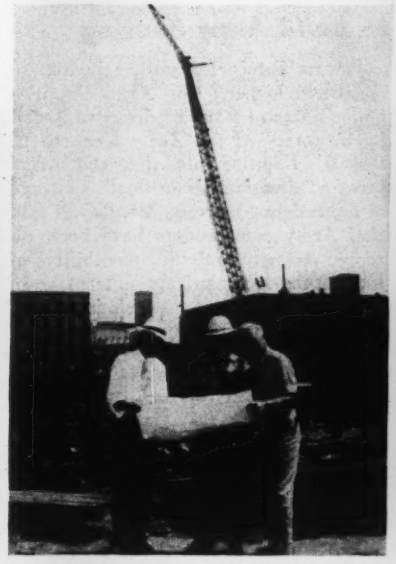
F. R. Cromwell, formerly city engineer of Mount Pleasant, Tex., has been made city manager of Terrell, Tex. He succeeds E. E. Boyd.

Robert A. Stauffer has been appointed assistant director of research of National Research Corp., Cambridge, Mass., and James H. Moore has been promoted to director of the metals department, succeeding Mr. Stauffer.

Larry Elsener, Chicago Bridge & Iron Co., and F. W. Panhorst, California state bridge engineer, seem interested in some distant object as they were snapped at Friant Dam while on a California ASCE convention field trip. Elsener is president of the San Francisco Section and Panhorst a national director of the association.



Mark V. Watrous, Colorado state highway engineer, was formerly a contractor and road builder in Pueblo. He has been in his present office for more than two years after having passed a state civil service commission examination with the highest grade.



Steel is starting to rise on Detroit's new $5,000,000 Veterans Memorial Building under the supervision of, left to right, R. C. Mauck, superintendent for Harley, Ellington & Day, Architects and Engineers, Detroit; Ed Allen, superintendent of erection, Whitehead & Kales, Detroit; and C. G. Seasword, engineer for Kuhne-Simmons Co., Decatur, Ill., general contractor on the project.

Col. F. J. Gillespie, left, district executive, Western Pennsylvania Military District of the 2nd Army, makes the formal presentation of the national colors to Col. R. B. Jackson, the commanding officer of the newly activated 454th Reserve Engineer Construction Battalion, which is sponsored by the Constructors Association of Western Pennsylvania. This battalion is the 85th unit sponsored by affiliated chapters of the Associated General Contractors of America.

OBITUARY

Col. George McClelland Derby, 92, a West Point graduate, who headed his class in 1878, died in New Orleans, La., Oct. 24. He retired from active duty with the Army Engineers in 1907, but was recalled at the outbreak of the first world war and was placed in charge of engineering work along the Mississippi River from Vicksburg to the Gulf. He had served with distinction in the Spanish-American war. He was chief engineer of the Fifth Army Corp from June till October, 1898. He was in charge of a balloon that accompanied a marching column on July 1 outside of Santiago. The balloon was sent up in daylight and drew much enemy fire, but Col. Derby escaped unharmed.

Joseph O. Whittemore, 78, a retired civil engineer, died at Miami, Fla., Oct. 21.

John A. Wilcox, 67, died Oct. 8 in Portland, Ore. For the last 17 years he had been a director and industrial engineer for the Longview Fibre Co., Longview, Wash. He had formerly taken part in design and construction of power dams in Alaska, at the Del Monte properties in California, and at the 1915 San Francisco Exposition.

Robert P. Lyons, 52, a civil engineer, died at Kansas City, Mo., recently. He was a partner in the Hoover-Lyons Const. Co. A graduate of the Missouri School of Mines, he was employed by the Missouri Highway Department before he went with the Ready-Mixed Concrete Co. about 20 years ago.

Allan Paul Staver, 41, a civilian engineer for the Army Engineers, died at Kansas City, Mo., Oct. 20.

T. H. Johnson, 88, former city engineer of Sioux City, Ia., and a pioneer in concrete paving work, died in that city recently. After his term as city engineer he organized the T. H. Johnson Engineering Co.

Edward B. Yancey, 60, a vice-president, and member of the board of directors and of the executive committee of the E. I. du Pont de Nemours and Co., died Oct. 24 at Wilmington, Del. Under his direction the du Pont company built and operated the Hanford, Wash., atomic energy plant. During the war he was general manager of the company's explosives department which built and operated many of the government's military explosive plants and also conducted research for the government.

Alonzo H. Yocum, 74, civil engineer and for many years surveyor of Delaware County, Pa., died Oct. 22, at Darby, Pa. He was a graduate of Drexel Institute of Technology, and was borough engineer for Colwyn, Collingdale, Folcroft and Darby Township.

Henry P. Bohmann, 82, who retired as superintendent of the Milwaukee, Wis., waterworks system in 1941, died Oct. 24. Mr. Bohmann was with the city for 48 years, the last 28 years as superintendent. He was responsible for many major improvements in the waterworks department and the city's $5,000,000 filtration plant was constructed while he was superintendent.

Edward M. Bassett, 85, known as the father of American zoning and former N. Y. Public Service Commissioner, died in New York City, Oct. 27. He was the chief author of and prime mover in bringing into being the first comprehensive zoning ordinance, which became a model for the rest of the country, was adopted by the New York City Board of Estimate in 1916.

Ask private enterprise to build Army housing

Private enterprise will be invited to construct housing for Army families under terms of a recent directive issued by Secretary of the Army Kenneth C. Royall. Pointing out that the Army faces a "dangerously critical" shortage of dependents' housing, Mr. Royall said that Army commanders have been directed to explore the possibility of interesting local private enterprise in constructing housing developments in urban areas near Army posts.

Meanwhile, to alleviate the situation temporarily, the Army is studying plans to build first-class trailer camp facilities at camps which are being activated as a result of Selective Service. This is one of the emergency means to provide housing at little or no expense to the government. Military personnel would provide their own trailers and pay for utilities and site rental, at an estimated average cost of approximately $95 a year.

The Army will build 1,500 permanent family units this year. Including these, however, the total will be only 29,000 family units in the U. S., territories, and possessions, half of which are temporary or converted units. This represents a shortage of more than 150,000 units.

MAJOR MEETINGS

American Public Health Association, Boston, Mass., Nov. 8-12.

National Association of Housing Officials, annual meeting, Hotel Statler, Boston, Mass., Nov. 13-1[illegible].

National Reclamation Association, Oklahoma City, Okla., Nov. 17-1[illegible].

Black Top Roads Association, Springfield, Ill., Dec. 2.

Society for Experimental Stress Analysis, annual meeting, Hotel Commodore, New York City, Dec. 2-4.

Highway Research Board, National Academy of Sciences and National Research Council, 2101 Constitution Ave., Washington, D. C., Dec. 7-10.

Chevalier goes abroad for ECA group meeting

Willard T. Chevalier, senior vice-president, McGraw-Hill Publishing Co., and former publisher of *Engineering News-Record*, arrived in London Oct. 24 to attend the meetings of the Anglo-American Council on Productivity. Col. Chevalier is one of the nine American members of the council appointed by Paul G. Hoffman, head of the Economic Cooperation Administration, to develop means for increasing industrial and construction productivity in the United Kingdom.

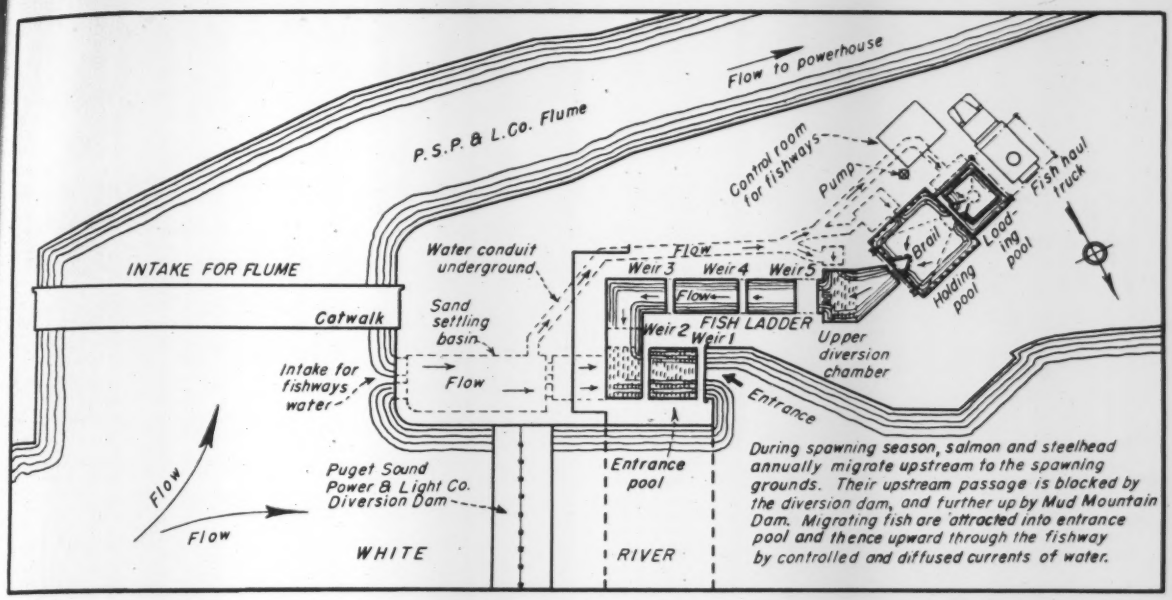
UN lets steel contract for 40-story building

American Bridge Co. has been awarded the contract for furnishing and erecting steel for the 40-story United Nations Secretariat building to be constructed on the world capital site in New York City (*ENR* Aug. 19, p. 73).

This, the first structure in the permanent UN home, will require about 13,000 tons of steel and measure 72 ft. in width by 287 ft. in length. The building will comprise 39 floors and a penthouse above ground and two framed basements below street level. Erection will be begun by American Bridge Co. next spring.

Seattle rejects PE plea to protect "engineer"

A proposal by the Washington State Society of Professional Engineers that persons who run steam boilers and similar equipment be known merely as "operators" rather than "engineers" has been rejected by the city council of Seattle, Wash., which licenses such operators. The society contends that the operators are not engineers.



Salmon trapped and trucked at power dam

A new type of fish trapping facilities is under construction for the Corps of Engineers at the Puget Sound Power & Light Co. dam near Buckley, Wash., to facilitate collecting, trapping and transporting salmon and other species to their spawning grounds in the White River above Mud Mountain Dam.

Scheduled for completion next February, the $194,000 trap will attract fish into its ladder by piping river water into the fishway at its upper end and regulating its flow back through the structure to insure sufficient action without any unnecessary surge or boil. The fish, thus attracted, will travel up a series of five weirs through the diffusion chamber and into a holding pool 22 ft. deep and 18 ft. square.

Corps of Engineers Photo

AIR-BORNE SALMON ride a 125-ft. cableway in this hopper at the temporary fish trapping installation.

A scoop-like brail in the bottom of the holding pool will then be raised to permit counting of the fish before dumping them into a submerged hopper. When filled, the hopper will be elevated and moved to a point over a waiting tank-truck in which the fish load will be transported to an unloading site above Mud Mountain Dam, the Corps of Engineers structure.

Two trucks are to be used in the operation, each having a capacity of about 400 lbs. of fish and each equipped with gas-driven pumps that circulate the water to provide it with sufficient oxygen content during the journey.

Supervision furnished

Washington state will furnish a supervisor to oversee the trapping, handling and transportation of fish moving upstream, perform minor maintenance and repairs on the fishway structure and determine when the fish are to be hauled. Cost of the program is expected to be about $6,000 yearly.

Because the homing instinct of the salmon returning from salt water to fresh water spawning grounds is so strong, the fish cannot be left in the pool for any great length of time. Salmon have been known to leap 10 and 11 ft. out of the water in a vain effort to clear the barrier of such a holding pool. Thus, their transportation must be waiting day and night.

During construction of Mud Mountain Dam—just previous to the war—a fish ladder at the power company's diversion dam was converted into a temporary trap for moving fish to the upstream side of the project.

Figures furnished by the Washington State Fisheries Department indicate the extent to which this device was successful. Salmon run in 3-year cycles; in 1943 there were 1,513 fish trapped, and in 1946 the number was 3,811.

Each salmon permitted up the fresh water tributaries of Puget Sound is of economic value to the Pacific Northwest by virtue of its eventual contribution to commercial fishing. According to Col. L. H. Hewitt, Seattle District Engineer, results obtained in the White River indicate that this method of handling is practicable in many areas where fish ladders do not solve the migratory fish problem.

Corps of Engineers Photo

TANK TRUCKS TAXI the fish 12 miles upstream to a point above Mud Mountain Dam, in Washington.

CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded

Second Section

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ELSIE EAVES, Manager *J. A. MAHONEY, Reports* *E. R. BIGGERSTAFF, M. R. ROESSLER, Statistics*

WATER SUPPLY

BIDS ASKED

November 8

Mass., Brookline—Town Eng. Dpt., Town Hall, surface water drains, sewer construction, Griggs Rd. $100,000. CD 10/14—ENR 10/28.

LOW BIDDERS

Ark., Lewisville—Lewisville Water Works and Sewer System, H. H. Clayton, supt. and city recdr., rejected bids Oct. 15, water treatment plant with auxiliaries, appurtenances, L. B. **$49,957.** CD 10/26—ENR 10/23, under L.B.

Colo., Denver—Bd. Water Comrs., City and County Bldg., Oct. 18, 4,933 ft. 24 in. ID prestressed concrete water pipe, incl. couplings. Proposal 655, to be used on Holly St. between 9 and 1 Aves., from Lockjoint Pipe Co., 1718 California St., **$36,997,** f.o.b. Turner, Est. over $28,000, CD 10/20.

Ia., Charlton—City, W. W. Wegner, mgr., returned bids Oct. 11 unopened, watermain extens., fire hydrants, etc. **$45,000.** Will readvertise. CD 9/23—ENR 10/7.

O., Defiance—City, plant imprvs. for municipal WW, from Birmingham Constr. Co., 208 Hanna Bldg., Birmingham, Mich., **$144,590.** Charles E. Pettis, 518 Jefferson St., Toledo, consult. engr.

Tex., Abilene—City, Oct. 22, dismantling, re-erecting 500,000 gal. wooden water tank and constructing concrete fdn., from Bill B. Hendricks steel Erector, 2617 E. 1 St., Fort Worth, **$39,700.** Est. $30,000. CD 10/11—ENR 10/14.

Tex., Austin—City, Oct. 19, clear well at filter plant 3 m. g., all piping, etc., from J. M. Odom, Box 774, **$106,672.** CD 10/8.

CONTRACTS AWARDED

Ill., Lacon—City, City Hall, watermain exten., to W. L. Hall, Atwood, **$48,979.** Bids 9/13. CD 9/3.

Mass., Swansea—Town, C. E. Moore, selectman, water sys., to Edward F. Hughes, 53 State St., Boston. Est. **$200,000.** CD 9/2—ENR 9/16.

Tex., Bellaire—J. S. Norman Bldg. Corp., 4815 Richmond Rd., Houston, c.i. waterlines, own forces. **$38,000.**

Tex., Corpus Christi—City, c.i. watermains, Ward Island to Edgewater Terrace, Agnes St., Old Robstown Rd., force account. **$28,000.** S. F. Crecelius, Jr., city engr. CD 10/15/47—ENR 10/30/47.

Tex., Ennis—City, Dave Onstead, mayor, c.i. waterlines, force account. **$58,000.** CD 6/2—ENR 6/24.

Tex., Houston—Jess Little, 2620 Midland St waterlines, facilities, own forces. **$36,000.**

Wash., Yakima—City, City Hall, pipe for water sys. imprvs. to U. S. Pipe & Foundry Co., E. Burlington St., Burlington, N. J. **$102,943.**

SEWERS, WASTE DISPOSAL

BIDS ASKED

November 9

Mich., Detroit — City, City Hall, lateral sewer, Contr. PW 675. G. R. Thompson, city engr.

November 10

N. Y., Brooklyn—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, altering dock at Ward's Island Sewage Treatment Plant, Wards Island. Contr. R-15. Plans deposit $5. CD 8/22/45—ENR 9/6/45.

November 30

N. Y., Long Beach—City Council, City Hall, general construction Contr. A, electrical construction Contr. B; plumbing and heating Contr. C, for sewage disposal plant and general construction Contr. D, for pump stations and force mains; electrical construction Contr. E, for pump stations; plumbing and heating construction Contr. F, for East Park Avenue Pump Station. Plans deposit $25. Clarence Mac Callum, 299 Main St., Port Washington, consult. engr.; adv. ENR 11/4. CD 7/12/46—ENR 7/25/46.

LOW BIDDERS

Calif., Corning—City, Carnegie Library, 4 and Yolo Sts., Oct. 19, sewer line, appurtenances, from Ted Bares Constr. Co., 365 Warwick Ave., San Leandro, using vitr. clay pipe, **$186,338*****from N. P. Van Valkenburgh & Co., Box 1192, Sacramento, using concrete pipe **$168,601*****sewage treatment plant, from Charles MacClosky Co., 112 Market St., San Francisco, **$78,867.** CD 10/2.

Fla., Miami—City, Director P. Wks., Service, 321 Courthouse, rejected bids Oct. 6, sanitary sewer imprvs., part of Proj. SR-311. CD 9/17—ENR 9/23.

Md., Baltimore—Mayor & City Council, City Hall, Oct. 20, sanitary sewers, Contr. 375, from Frank Angelozzi Constr. Co., 123 S. High St., **$124,676.**

CONTRACTS AWARDED

Calif., Los Angeles—Los Angeles Co. Sanitation Dist. 1, 1206 Maple Ave., Alameda St. Exten. Trunk Sewer 3, 8,600 ft. 21- to 27-in. rein.-con. pipe, Lynwood and South Gate, to George Miller, 3132 Bandini Blvd., **$97,762.** Est. $70,000. Bids 10/13. CD 9/30.

Conn., Plainville—Town, R. W. Hyatt, Town Hall, main sewer line, to Louis Toffolon, 59 E. Main St., **$184,000.** CD 10/11—ENR

Mich., Detroit—City, City Hall, combined sewer, Merwin to Central Ave., UI 82-64, C2, to Mancini Constr. Co., and Miller-Tompsen Co., 23170 Schoenherr Rd., East Detroit, **$212,116.** Awarded 9/13. M. H. Frimodig, hy. engr.

S. D., Aberdeen—City, sanitary sewer and booster station, to Nodland-Alberg Co., Starbuck, Minn., **$145,085.** Bids 10/11. Greeley & Hansen, 220 S. State St., Chicago, Ill., engrs.

S. D., Gettysburg—City, sewer, sewer lift station, watermain extens., to Nodland-Alberg Co., Starbuck, Minn., **$99,939.** Dakota Eng. Co., Mitchell, engr. Bids 10/12.

Tex., Bellaire—J. S. Norman Bldg. Corp., 4815 Richmond Rd., Houston, sanitary sewers, own forces. **$60,000.**

Tex., Ennis—City, Dave Onstead, mayor, sanitary sewers, force account. **$55,000.** CD 6/2.

Tex., Houston—Jess Little, 2620 Midland St., sanitary sewers, drainage, own forces. **$60,000.**

Ont., St. Thomas—City, Mill Creek Outlet Sewer, Sect. 1, to W. B. Bennett Constr. Co., 45 Whiting Ave., Oshawa, and Sect. 2, to A. E. Rule, Ltd., 1109 Millwood Rd., Leaside, Approx. **$144,000.** CD 10/11—ENR 10/14.

BRIDGES

BIDS ASKED

November 10

N. Y., Brooklyn—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, laying 2 in. asphaltic concrete wearing course on existing concrete roadway surfaces of Brooklyn and Queens approaches of Kosciusko Bridge over Newtown Creek. Plans deposit $5.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterworks $28,000; other public works $50,000; industrial buildings $68,000; other buildings $250,000.

Classes of Construction

(Name in order of Listing)

Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Latin America
Public Buildings
Commercial Buildings
Industrial Buildings

Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.;

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

† Federal Government
● Project of $1,000,000 or over.
ENR Engineering News-Record
CD Engineering News-Record Construction Daily

November 23

Ont., Toronto — Chairman Bd. Control, bridge over Rosedale Valley Rd. at Huntley St., for Municipality. Over $75,000. M. Stewart, city engr.

About December 1

Tenn., Chattanooga — City, c/o Marion Boriss, engr., repairing Walnut Street Bridge. $160,000. CD 8/12—ENR 9/2.

LOW BIDDERS

California—State Hy. Dpt., 808 State Bldg., Los Angeles, Oct. 21, bridge, approaches, Orange Co., from C. MacClosky Co., 112 Market St., San Francisco, **$295,086.** CD 9/29—ENR 10/7.

Ill., Chicago—City, Dpt. Purchases Contracts, & Supplies, City Hall, Oct. 26, bridge approaches, concrete pavement, sidewalks etc., from Central Teaming & Constr., 8339 S. Luela St., **$153,389.**

Kentucky—State Hy. Dpt., Frankfort, received no bids, Oct. 22, bridge, substructure, superstructure and 4.587 mi. approaches, Monticello-Burnside Road, Pulaski Co. CD 10/6—ENR 10/14.

●**Kentucky**—State Hy. Dpt., Frankfort, Oct. 22, bridge, superstructures, Somerset-Burnside Rd., (Pitman Creek) and Monticello-Burnside Rd., (South Fork) Pulaski Co., from American Bridge Co., Union Trust Bldg., Cincinnati 2, O., **$432,253** and **$463,979** respectively*** bridge substructure, grade, drain, 4.587 mi. Monticello-Burnside Rd., (South Fork) Pulaski Co., from R. R. Dawson Bridge Co., Bloomfield, **$495,856*****bridge superstructure Somerset-Russell Springs Rd., (Fishing Creek) Pulaski Co., from Virginia Bridge Co., 821 Madison Ave. N.E., Roanoke, Va., **$806,755***** bridge superstructure, Somerset-Burnside Rd., (Burnside) Pulaski Co., and bridge superstructure Monticello-Albany Rd., (Beaver Creek) Wayne Co., from Midland Structural Steel Co., Cicero 50, Ill., **$748,440** and **$119,271** respectively***bridge and 0.7 mi. approaches, Russell Co., from Talbott-Myers Constr. Corp. and Wellner Contg. Co., Winchester, **$257,632** ***substructure, superstructure and 0.388 mi. approaches Monticello-Allbany Rd., (Beaver Creek) Wayne Co., from Harry O. Wyse, 308 S. Hanover Ave., Lexington, **$262,833***** bridge and 0.416 mi. approaches Monticello-Albany Rd. (Otter Creek) and substructure and 0.388 mi. approaches, Monticello-Albany Rd. (Beaver Creek), Wayne Co., from Wellner Contg. Co., Winchester, **$224,213** and **$129,418,** respectively. CD 10/6—ENR 10/14.

Md., Baltimore—Mayor & City Council, City Hall, Oct. 20, Annapolis Road Underpass, at intersection Annapolis Rd., U. S. Rt. 301 and through (limited access) Hy., from Wash., D. C., to Baltimore, Md. F. A. Rt. 142, from DeLuca Davis Constr. Co., 1203 S. Clinton St., Baltimore, **$469,322.** CD 10/2—ENR 10/7.

Michigan—State Hy. Dpt., Lansing, Oct. 14, bridge, etc., Oceana Co., from Hertel & Deyo Co., 5205 S. Division Ave., Grand Rapids, **$187,742.** CD 10/7.

●**New Jersey**—State Hy. Dpt., Trenton, Oct. 26, bridge, approaches, Middlesex Co., from Brann & Stuart, Broad St. Station Bldg., Phila. Pa., **$1,635,663.** CD 10/8—ENR 10/14.

Pa., Pittsburgh — Comrs. Alleghany Co., County Office Bldg., Oct. 19, Glenwood-Hays Bridge repairs, from Paul L. Medis, 200 Saw Mill Run Blvd. **$236,900.** Est. $250,000. CD 10/15.

CONTRACTS AWARDED

Michigan—State Hy. Dpt., Lansing, grade separation, Wayne Co., to Louis Garavaglia, Centerline, **$331,445.** Bids 9/9, awarded 9/24. CD 9/1.

†**Washington**—Pub. Roads Admin., Broadway-Oak Bldg., Portland, Ore., bridge on 0.4 mi. South Fork Salmon Creek Road and Salmon Meadows Road, Chelan Natl. Proj., Washington Forest Development Road Projs. 352-B and 370-B, Okanogan Co., to Riggie & Creighton, Yakima, **$54,517.** Bids 10/22. CD 10/13.

West Virginia—State Road Comn., Charleston, Veterans Hospital Bridge S. 1773 two 73 ft. and one 95 ft. I-beam spans on concrete substructure, Harrison Co., to Keeley Constr. Co., Clarksburg, **$106,905;** McKinney Bridge S 1768, Ritchie Co., to J. M. Francesa & Co., Fayetteville, **$80,220.** Bids 10/14. CD 10/4—ENR 10/7.

STREETS AND ROADS

BIDS ASKED

November 16

†**Arizona**—P. Rds. Admin., 303 W. Jefferson St., Phoenix, 8.24 mi. hy. imprv., Ariz.-2-C4-D6, Grand Canyon Old Trails, Kaibao National Forest, Coconino Co. Plans deposit $10.